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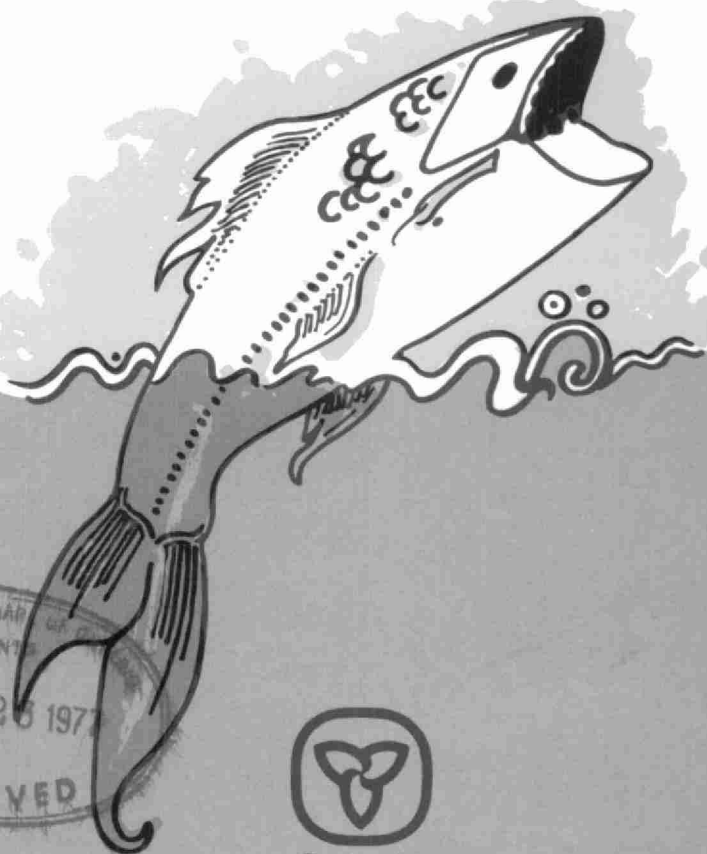
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# GUIDE TO EATING ONTARIO SPORTFISH



Ontario

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## Being sensible

Fishing still means knowing about bait, tackle and where the big ones are.

But today, it also means being cautious about the amount and type of sports fish you eat.

It's a fact of modern life that fish in many parts of the world have been affected by natural and industrial contaminants. As an industrialized province, Ontario has not escaped this problem. But the province is also a leader in identifying sources of contamination and restricting them.

Principal villain has been the metal mercury, although man-made materials such as DDT, mirex and polychlorinated biphenyls (PCB) have also been found in fish.

None of these contaminants has ever been found in quantities that would make any of Ontario's lakes unsafe for drinking or swimming.

It's a fact, too, that fish can become contaminated by mercury from natural sources—from concentrations of mercury naturally occurring as mineral deposits in the bedrock.

People who eat large amounts of contaminated fish over a period of time may become ill. In extreme cases, methylmercury poisoning can be fatal.

But the picture is by no means gloomy for Ontario sports fishermen. Some lakes have fish that are clear of contamination. Where the problem does exist, many species of fish are still safe to eat, some in limited quantities. In other cases, certain fish should be avoided altogether.

The purpose of this booklet is to present facts about fish contamination, developed from material assembled by the ministries of the Environment, Health, Labour and Natural Resources. Copies of this booklet and individual lake cards are available from regional and district offices of the ministries of Environment and Natural Resources, or by writing to: Ministry of Environment,

Information Services Branch,

135 St. Clair Ave., W.,

Toronto, Ontario, M4B 1P5.

Indicate specific bodies of water for which you require information.

There's still plenty of great fishing in Ontario. Read this booklet and make your fishing safe and enjoyable.

## How lakes become contaminated

The substances causing most concern at present as contaminants in fish in Ontario are mercury, PCB (polychlorinated biphenyls), mirex and DDT.

Mercury, a heavy metal, is the most widespread contaminant and may come from either industrial activity or natural sources. Bacteria in sediments convert metallic mercury into the more toxic methylmercury.

The others are man-made substances. PCB and DDT are found in many parts of the province. Mirex has been found to date only in Lake Ontario and adjacent portions of the St. Lawrence and Niagara rivers.

Mercury is found naturally in the form of mineral deposits, often with other metals such as lead, silver and copper. Fish in lakes far removed from industrial activity can contain mercury from these natural deposits.

The losses of mercury from industrial processes to Ontario's waterways have been cut back in recent years as government and industry became aware of the problem, identified the sources, and took remedial action.

Some of the most common industrial sources are: chlor-alkali plants that produce bleaches and



other substances for pulp and paper processing; pulp and paper wastewater discharges in plants that used mercurial compounds for the control of slime growth; silver and gold mining where the mercury is used to separate these metals from the ore; and, sewage treatment plants which concentrate a wide variety of municipal sources of mercury.

Some mercury entering waterways is converted to methylmercury by biological processes and is taken up by fish either directly from the water or by eating contaminated organisms.

PCB were widely used between 1929 and 1970 as additives in oils, greases, adhesives and other materials where its fire retardant properties were valuable. They are still used under controlled conditions in electrical equipment such as transformers.

Mirex was used as a fire retardant in plastic parts and sealants. Although no contamination has occurred from Ontario sources, mirex has been found in Lake Ontario as a result from discharges from a U.S. plant on the Niagara River.

Until controls were placed on its use in the late 1960's, DDT use was widespread for controlling mosquitoes and other pests in recreational and agricultural areas.

## **What's being done**

Since contaminants were first discovered in fish in the 1960s, governments have developed extensive monitoring programs to detect contaminants and have used their powers to restrict the manufacture or use of the offending substances.

Here's where we stand today:

### **Mercury**

**Chlor-alkali plants**—in 1970 the six plants using mercury in Ontario were ordered by the province to curtail mercury losses. All complied and contamination dropped from several pounds per day to a few ounces. Today, only two plants use mercury and their mercury losses to waterways are extremely low. In 1977, one of the two plants will close.

**Pulp and paper mill slimicides**—use of mercurial slimicides was stopped in 1970.

**Mining**—mercury was in widespread use to separate gold and silver from the ore, in the early twentieth century. It is still used in some gold mines but in a controlled manner. However, some mercury is still being found in disposal areas from gold, silver and copper mines.

**Sewage treatment plants**—controls have been placed on disposal of digested sewage sludge because a mercury build-up can occur if used as a soil conditioner for a long period of time. Small quantities of mercury may be contained in sewage treatment plant effluents and discharged to the watercourse.

## **PCB**

Since 1972, the sole North American manufacturer has voluntarily restricted sales of PCB to uses in electrical transformers and other sealed containers. Waste PCB are disposed of by methods that prevent contamination.

Current PCB contamination arises from unrestricted handling of the materials during the decades prior to their being recognized as a health hazard.



## **Mirex**

Mirex was discovered in fish and sediments of Lake Ontario in 1975. The U.S. manufacturer has stopped discharges of mirex into Lake Ontario, although minor contamination may still occur from drainage systems saturated with mirex in the past. No traces of mirex have been found in water, sediments or fish near the two Ontario plants which used mirex until 1970 to make plastic parts and sealants.

## **DDT**

Use of the pesticide DDT has been restricted since 1970. Its presence is still detectable in fish in those areas of Ontario where large amounts were applied. The concentration of DDT in the environment has been declining since its use was stopped.

## **How fish are affected**

Fish contaminated by mercury, PCB, mirex or DDT show no outward signs of contamination. Contaminant levels must be determined using modern laboratory techniques.

Mercury in methylated form is readily absorbed by fish, but excreted at a very slow rate. The result is a build-up of mercury in fish. Walleye, pike and lake trout tend to have higher mercury levels than other fish because their diet consists primarily of fish.

PCB, mirex and DDT build up in fish much as mercury does, but tend to accumulate in the fatty tissues. Thus "fatty" fish, such as whitefish, smelt and coho salmon often have high concentrations in those waters where PCB, mirex and DDT are present.

Contaminants tend to accumulate as the fish grows. As a rule, therefore, the larger and older the fish, the higher the concentration of contaminant in its flesh.

Conversely, many smaller fish tend to be free of serious contamination. And since different species are affected differently by contamination depending on their diet, those lakes containing contaminated fish usually contain a selection of safe-to-eat fish as well.

## Effects on human health

Mercury is present in the environment. Everyone has, therefore, small amounts of mercury in the body. Methylmercury intake, however, is almost entirely from fish. Most individuals may have a level of up to two or three milligrams. This is not known to cause any problems to humans. With levels even seven times usually found, people, as a rule do not show any signs or symptoms of illness due to methylmercury.

Illness or death from fish contaminated by methylmercury has been reported only from Japan. Between 1954 and 1965, 90 people died in Minamata, another 25 in Niigata. In both instances, fish had been contaminated by chemical plants discharging methylmercury directly into waters that were fished commercially.

The World Health Organization recommends a daily mercury intake not exceeding an amount that would result in the retention of two to three milligrams in the body. Estimates of methylmercury in several population groups in Ontario indicate that this level is generally not exceeded except in the Grassy Narrows and White Dog reserves in northwestern Ontario. There, high consumption of fish and high mercury levels in the fish resulted in body burdens above the maximum recommended limit.

Both the World Health Organization and the Canadian guidelines are necessarily conservative. Body burdens exceeding the guidelines can be tolerated by most adults. Increased restraints are





placed on children under 15 and women of childbearing age.

As for PCB and mirex, animal experiments indicate that they may have cancer-causing properties and may interfere with fertility. Their intake, therefore, warrants restriction.

## **How safe is safe?**

Recommendations for acceptable consumption of fish are based on information from the World Health Organization, and data from Japan, Iraq and the United States. In Iraq, where contaminated grain was consumed, signs or symptoms of methylmercury poisoning were generally absent in persons with a mercury burden below 20 milligrams.

The Ontario guideline for safe short-term consumption is 25 per cent of the 20 mg level—five milligrams.

Most individuals have a mercury body burden well under three mg and would, therefore, not reach five mg upon following these recommendations.

Many fish contain so little mercury or other contaminants, that eating them will have little effect on usual body burdens.

Fish with more than 1.5 parts per million of mercury should not be eaten. Fish containing between 0.5 and 1.5 parts per million of mercury can be eaten by adults (except women of child-bearing age), in restricted amounts.

## **Guidelines to eating**

Ontario lakes for which there is contaminant information are listed on pages 11 and 12.

Information about fish in these lakes is available from regional and district offices of the ministries of Environment and Natural Resources or by writing to:

Ministry of the Environment,  
Information Services Branch,  
135 St. Clair Ave. W.,  
Toronto, Ontario, M4B 1P5.

As to methylmercury levels, fish have been placed into categories ranging from those with the lowest level of mercury, on which there is no restriction, to those which should not be consumed.

Recommendations are based on levels of contamination of fish as well as on length of the fishing holiday. A larger quantity of fish may, therefore, be consumed each day during a one-week holiday than should be consumed each day of a three-week fishing trip.

Long-term fishermen—fishing guides and those consuming fish for extended periods—should further restrict their intake.

The monitoring program initiated in 1969 has been extended from the St. Clair and English-Wabigoon system to waterways near other industries, to mining sites and areas of natural mineral deposits and to recreational areas. Many additional lakes have since been surveyed.

Not all lakes have been monitored so far. However, as the monitoring programs continue, more information will be added to this booklet.

Without exception, all lakes monitored contain some fish that are safe to consume. The safe species, the lengths of safe fish, and the types of restrictions vary from lake to lake.

To enjoy a safe fishing holiday, make your own judgments based on the information available for your favorite lake.

And good fishing!




# Recommendation for fish consumption:

## To check your fish:






1. Identify the species. 2. Measure length of fish from fork of tail to end of nose. 3. Check the chart below.

The following guidelines reflect the maximum recommended consumption of fish according to contaminant content and duration of fishing vacation—one-week, two-week, three-week and over three weeks. Fishing holidays should be spaced at least six months apart if the maximum recommended for


 or  fish has been consumed.

Children under 15 and women of child-bearing age should eat only .

## For short-term consumption

Category	One week	Two weeks	Three weeks
	No restrictions*	No restrictions*	No restrictions*
	10 meals per wk. 2.3 kg/week (5.1 lb./week)	5 meals per wk. 1.3 kg/week (2.8 lb./week)	4 meals per wk. 0.95 kg/week (2.1 lb./week)
	7 meals per wk. 1.54 kg/week (3.4 lb./week)	4 meals per wk. 0.86 kg/week (1.9 lb./week)	3 meals per wk. 0.63 kg/week (1.4 lb./week)
	None	None	None
	Occasional meals only	Occasional meals only	Occasional meals only

### NOTES






Anglers should NOT take home fish for freezing and later consumption unless it is from category .

Fish containing more than the maximum level of PCB, mirex and DDT indicated by the federal guidelines should be eaten only occasionally. For the purpose of short-term consumption this means one to two meals per week.

A meal is approximately the equivalent of 230 grams (8 oz.)

\*No restrictions are placed on consumption of fish in this category according to federal guidelines.

## For long-term consumption\*\*

Fish Category	Meals
	No restrictions*
	0.226 kg/week 0.5 lb./week
	0.136 kg/week 0.3 lb./week
	NONE
	Occasional Meals Only

Fish containing more than the maximum level of PCB, mirex and DDT indicated by the federal guidelines should be eaten only occasionally. For the purpose of long-term consumption, this means one to two meals per month.

A meal is approximately the equivalent of 230 grams (8 oz.)

\*No restrictions are placed on consumption of fish in this category according to federal guidelines.

\*\*For the purpose of this recommendation, those who fish on and off for part of the year exceeding three weeks are considered long-term consumers.

# List of monitored waters

Information about fish in the lakes listed below is the latest available (May 1977). No monitoring has been undertaken—and therefore no information is available about—waterbodies not included in this list.

## Inland lakes and rivers

Abitibi Lake	Guilfoyle Lake
Agnew Lake	Gun Lake
Agonzon Lake	Hamlock Lake #1
Amkougami Lake	Hamlock Lake #2
Anstruther Lake	Harris Lake
Aylen Lake	Hogan Lake
Badesdawa Lake	Howard Lake
Ball Lake	Lake Huron
Bennet Lake	Douglas Point,
Black River	Saugeen River
Blueberry Lake	Goderich
Bow Lake	Lake George
Buck Lake	Nottawasaga Bay
Caribou Lake	Raft Island, Britt,
Chase Lake	Moon River
Cheddar Lake	Serpent River
Clay Lake	Spanish River
Constance Lake	Thornbury, Owen Sound
Crosswise Lake	Joseph Lake
Crowe Lake	Jowsey Lake
Dalles, The	Kaginu Lake
Delaney Lake	Kamiskotia Lake
Dollars Lake	Kawinogans River
Eagle Lake	Keenoa Lake
Eden Lake	Kenogami Lake
Eels Lake	Kenogaming Lake
Elliot Lake	Kenogamissi Lake
Emerald Lake	Kernick Lake
Evangeline Lake	Kerr Lake
Favel Lake	Keys Lake
Francklyn Lake	Kioshkowki Lake
Fraser Lake	Koshlong Lake
Frederick House Lake	Lacloche Lake
French River	Lake of Bays
Lower French River	Lake La Muir
Upper French River	Larder Lake
Garden Lake	Little French River
Gaugino Lake	Little Manitouwadge Lake
Giroux Lake	Little Mose Lake
Gooseneck Lake	Louisa Lake
Gough Lake	Manitou Lake
Grassy Narrows Lake	Marshall Lake

Mattagami Lake  
Mattagami River  
Maynard Lake  
McCarthy Lake  
Meandering Lake  
Memesagamesing Lake  
Mesomikenda Lake  
Mindemoya Lake  
Minisinakwa Lake  
Minnow Lake  
Mississagi River  
Mississippi River  
Moir Lake  
Moose River  
Mose Lake  
Mud Lake  
Muskoka Lake  
Nabakwasi Lake  
Nepahwin Lake  
Nighthawk Lake  
Lake Nipissing  
Lake Ontario  
    Bay of Quinte  
    Credit River  
    Humber River to  
        Bluffer's Point  
    Port Dalhousie  
    Rouge River  
    St. Lawrence River  
    Toronto Islands  
Opasatika Lake  
Papakomeka Lake  
Paudash Lake  
Pharand Lake  
Pickle Lake  
Ponsford Lake  
Porcupine Lake  
Pratt Lake  
Ramsey Lake  
Red Cedar Lake  
Restoule Lake  
Rideau River  
Robin Lake  
Roughrock Lake  
Round Lake

Routine Lake  
Lake St. Clair  
Lake St. Joseph  
Lake St. Peter  
Sand Lake  
Sandy Lake #1  
Sandy Lake #2  
Sasaginaga Lake  
Separation Lake  
Sesekinika Lake  
Shack Lake  
Lake Simcoe  
Skeleton Lake  
Snigisi Lake  
Snook Lake  
Snowshoe Lake  
Stoco Lake  
Stony Lake  
Sup Lake  
Lake Superior  
    Black Bay  
    Jackfish Bay  
    Moss Island  
    Michipicoten Bay  
    Nipigon Bay  
    Peninsula Harbor  
    Pine Bay  
    Thunder Bay  
Lake Talon  
Tay River  
Lake Temagami  
Tetu Lake  
Thames River  
Lake Timiskaming  
Tomiko Lake  
Toole Lake  
Toothpick Lake  
Trapline Lake  
Umfreville Lake  
Victoria Lake  
Wabigoon Lake  
Watabeag Lake  
Wendigo Lake  
Woodcock Lake

**CHECK  
BEFORE  
YOU EAT**

